

SEQUENCE LISTING

<110> Mueller, John P.  
Baima, Eric T.

<120> HAR A NUCLEIC ACIDS, POLYPEPTIDES, AND RELATED METHODS  
AND USES THEREOF

<130> PC11013

<140>

<141>

<160> 10

<170> PatentIn Ver. 2.1

<210> 1

<211> 1497

<212> DNA

<213> Enterococcus faecalis

<400> 1

```
atgtcgaaaa ttgaactaaa acaactatct tttgcctatg ataatcaaga agtattgctt 60
tttgatcagg caaatatcac gatggatacc aattggaaat taggattgat tggccgcaat 120
ggcgtggga aaacaacctt attagattg ttacaaaaac agttggatta ccaaggagag 180
attcttcac aagtcgattt cgtctatttt ccacaaacag ttgcagaaga acaacagctc 240
acttattatg tcttacaaga ggtgacttct tttgaacagt gggaattaga acgagaatta 300
acgcttttaa acgttgatcc tgaagtttta tggcggccct tttcttcttt atcaggcggc 360
gaaaagacga aagttttatt aggtcttctt tttattgaag aaaatgcctt tcctttaatt 420
gacgagccaa caaatcattt agatctagct ggcagacaac aagtggctga atatttgaag 480
aaaaagaaac acgggtttat tttagtcagc cagatcggg catttggtga tgaagtgggt 540
gatcatattt tggcgattga aaaaagtcaa ttgacgctgt atcaagggaa tttttctatt 600
tatgaagagc aaaaaaaatt aagagatgct tttgaactag cagaaaatga aaaaaatcaa 660
aaagaagtca atcgcttgaa agaaaccgct cgtaaaaaag cggaatggtc gatgaaccgt 720
gaaggtgata agtacggcaa cgctaaggaa aaaggagcg gggcgatttt tgatacagga 780
gccattgggtg cccgggcagc gcgcgtaatg aagcgctcga aacacattca acaacgcgcc 840
gaaacacaat tagcagaaaa agaaaaacta ttaaaagatc ttgagtatat tgatcctttg 900
tcaatggatt atcagccaac gcatcacaaa acattattga cgggtggaaga gcttcgtcta 960
ggctacgaga aaaattggct atttgcgcca ctttctttt caataaacgc gggagaaatt 1020
gttggaataa cagggaaaaa tggctcagga aaatcgagct taattcagta tttattggat 1080
aatttttctg gggattcaga aggcgaagcc actttggctc accaattaac catttcttat 1140
gtgcgccaag attatgaaga caatcaagga actttatccg aatttgcaga gaaaaatcag 1200
ttagattaca ctcaattttt aaataactta cgaaaacttg ggatggagcg cgccgttttc 1260
actaatcgaa ttgaacaaat gagtatggg caacggaaaa aagtcgaagt agccaaatca 1320
ttgtctcaat cagctgaact ttatatttgg gatgaacccc ttaattactt ggatgtattt 1380
aatcatcaac aattagaagc gctaattctt tctgtgaagc ctgcaatgct agtgattgag 1440
catgatgcac atttcatgaa gaaaataaca gataaaaaaa ttgtcttgaa atcataa 1497
```

<210> 2

<211> 498

<212> PRT

<213> Enterococcus faecalis

<400> 2

Met Ser Lys Ile Glu Leu Lys Gln Leu Ser Phe Ala Tyr Asp Asn Gln  
1 5 10 15

Glu Val Leu Leu Phe Asp Gln Ala Asn Ile Thr Met Asp Thr Asn Trp  
20 25 30

20050501 013002

Lys Leu Gly Leu Ile Gly Arg Asn Gly Arg Gly Lys Thr Thr Leu Leu  
 35 40 45  
 Arg Leu Leu Gln Lys Gln Leu Asp Tyr Gln Gly Glu Ile Leu His Gln  
 50 55 60  
 Val Asp Phe Val Tyr Phe Pro Gln Thr Val Ala Glu Glu Gln Gln Leu  
 65 70 75 80  
 Thr Tyr Tyr Val Leu Gln Glu Val Thr Ser Phe Glu Gln Trp Glu Leu  
 85 90 95  
 Glu Arg Glu Leu Thr Leu Leu Asn Val Asp Pro Glu Val Leu Trp Arg  
 100 105 110  
 Pro Phe Ser Ser Leu Ser Gly Gly Glu Lys Thr Lys Val Leu Leu Gly  
 115 120 125  
 Leu Leu Phe Ile Glu Glu Asn Ala Phe Pro Leu Ile Asp Glu Pro Thr  
 130 135 140  
 Asn His Leu Asp Leu Ala Gly Arg Gln Gln Val Ala Glu Tyr Leu Lys  
 145 150 155 160  
 Lys Lys Lys His Gly Phe Ile Leu Val Ser His Asp Arg Ala Phe Val  
 165 170 175  
 Asp Glu Val Val Asp His Ile Leu Ala Ile Glu Lys Ser Gln Leu Thr  
 180 185 190  
 Leu Tyr Gln Gly Asn Phe Ser Ile Tyr Glu Glu Gln Lys Lys Leu Arg  
 195 200 205  
 Asp Ala Phe Glu Leu Ala Glu Asn Glu Lys Ile Lys Lys Glu Val Asn  
 210 215 220  
 Arg Leu Lys Glu Thr Ala Arg Lys Lys Ala Glu Trp Ser Met Asn Arg  
 225 230 235 240  
 Glu Gly Asp Lys Tyr Gly Asn Ala Lys Glu Lys Gly Ser Gly Ala Ile  
 245 250 255  
 Phe Asp Thr Gly Ala Ile Gly Ala Arg Ala Ala Arg Val Met Lys Arg  
 260 265 270  
 Ser Lys His Ile Gln Gln Arg Ala Glu Thr Gln Leu Ala Glu Lys Glu  
 275 280 285  
 Lys Leu Leu Lys Asp Leu Glu Tyr Ile Asp Pro Leu Ser Met Asp Tyr  
 290 295 300  
 Gln Pro Thr His His Lys Thr Leu Leu Thr Val Glu Glu Leu Arg Leu  
 305 310 315 320  
 Gly Tyr Glu Lys Asn Trp Leu Phe Ala Pro Leu Ser Phe Ser Ile Asn  
 325 330 335  
 Ala Gly Glu Ile Val Gly Ile Thr Gly Lys Asn Gly Ser Gly Lys Ser  
 340 345 350

20060521-013002

Ser Leu Ile Gln Tyr Leu Leu Asp Asn Phe Ser Gly Asp Ser Glu Gly  
355 360 365

Glu Ala Thr Leu Ala His Gln Leu Thr Ile Ser Tyr Val Arg Gln Asp  
370 375 380

Tyr Glu Asp Asn Gln Gly Thr Leu Ser Glu Phe Ala Glu Lys Asn Gln  
385 390 395 400

Leu Asp Tyr Thr Gln Phe Leu Asn Asn Leu Arg Lys Leu Gly Met Glu  
405 410 415

Arg Ala Val Phe Thr Asn Arg Ile Glu Gln Met Ser Met Gly Gln Arg  
420 425 430

Lys Lys Val Glu Val Ala Lys Ser Leu Ser Gln Ser Ala Glu Leu Tyr  
435 440 445

Ile Trp Asp Glu Pro Leu Asn Tyr Leu Asp Val Phe Asn His Gln Gln  
450 455 460

Leu Glu Ala Leu Ile Leu Ser Val Lys Pro Ala Met Leu Val Ile Glu  
465 470 475 480

His Asp Ala His Phe Met Lys Lys Ile Thr Asp Lys Lys Ile Val Leu  
485 490 495

Lys Ser

<210> 3  
<211> 1644  
<212> DNA  
<213> Bacillus subtilis

<400> 3  
atgaaagaga tcgtaacatt aacaaacggt agctatgaag taaaggatca aactgttttt 60  
aaacatgtaa acgccagtgt tcagcaagga gatatacatt ggattatcgg caaaaacggc 120  
gctgggaaat ctacgttgct gcacctcatt cacaatgact tagcccctgc acagggtcaa 180  
atccttcgga aggatataaa actggctttg gttgaacagg aaaccgcggc gtattccttt 240  
gcggtacaga cacctgccga aaagaagtta ctggagaaat ggcattgtgc tcttcgtgat 300  
tttcatcagt taagcggcgg tgaaaaactg aaagcgcggc tggcgaaagg actatcagag 360  
gatgcagatc tgctgctggt agatgaaccg acaaaccacc ttgatgaaaa aagcttgcaa 420  
tttctcatcc aacagctgaa acattataac ggcaactgtg ttctcgtttc tcacgatcga 480  
tatttttttag acgaagccgc aacaaaaata tggctcgctt aggatcagac gctgattgaa 540  
ttcaaaggga attactccgg gtatatgaag ttccgggaga agaaaagact caccacagcag 600  
cgtgaatatg aaaagcagca aaaaatggtt gaacggattg aagcacaat gaatgggctc 660  
gcttcttggt cggaaaaagc ccatgctcaa tcgacgaaaa aggaagggtt taaagaatat 720  
caccgggtaa aagcgaagcg tacggatgcc cagataaaat ccaagcagaa gcggcttgaa 780  
aaagagcttg aaaaagcaaa ggcggaacc gttacccag aatatacagt ccgcttttca 840  
atcgatacaa cccacaaaac aggaaaacgt tttttagaag ttcagaatgt' aacaaaagcg 900  
tttgagaaaa ggactctctt taaaaacgca aactttacaa ttcagcacgg cgaaaagggt 960  
gcatcatag gcccaatgg cagcggaaaa acgacattac tgaacatcat tctgggacag 1020  
gaaacagcag aaggaagtgt atgggtgtcg ccgtccgcaa acatcggcta tttaacgcag 1080  
gaggtgtttg atttgccttt agaacaaaca ccggaagagt tatttgagaa tgaaacattc 1140  
aaagcaaggg ggcacgttca aaatctgatg aggcacttag gttttacagc cgcccaatgg 1200  
actgaaccga tcaagcatat gagtatgggt gagcgtgtaa agatcaagct gatggcatat 1260  
attctggagg aaaaagacgt gctgatttta gatgagccga caaacattct cgacctgccc 1320  
tcacgcgaac agctggaaga aacctgtca caatacagcg gcacattgct ggcgggttca 1380  
catgaccgat actttctcga aaaaacaaca aacagtaaac tcgtcatctc aaacaacggc 1440

20050501 013002

atcgaaaagc agttaaacga cgttccttca gaaagaaatg agcgggagga gcttcgggtta 1500  
aagcttgaga cagaaagaca agaagtgtcg ggaaagctca gttttatgac gccaaatgat 1560  
aaagggtata aggagcttga tcaggctttc aatgagctta cgaaacgaat aaaagagctg 1620  
gatcatcaag acaaaaaaga ctga 1644

<210> 4  
<211> 547  
<212> PRT  
<213> Bacillus subtilis

<400> 4

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Lys | Glu | Ile | Val | Thr | Leu | Thr | Asn | Val | Ser | Tyr | Glu | Val | Lys | Asp |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Gln | Thr | Val | Phe | Lys | His | Val | Asn | Ala | Ser | Val | Gln | Gln | Gly | Asp | Ile |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Ile | Gly | Ile | Ile | Gly | Lys | Asn | Gly | Ala | Gly | Lys | Ser | Thr | Leu | Leu | His |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Leu | Ile | His | Asn | Asp | Leu | Ala | Pro | Ala | Gln | Gly | Gln | Ile | Leu | Arg | Lys |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Asp | Ile | Lys | Leu | Ala | Leu | Val | Glu | Gln | Glu | Thr | Ala | Ala | Tyr | Ser | Phe |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Ala | Asp | Gln | Thr | Pro | Ala | Glu | Lys | Lys | Leu | Leu | Glu | Lys | Trp | His | Val |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Pro | Leu | Arg | Asp | Phe | His | Gln | Leu | Ser | Gly | Gly | Glu | Lys | Leu | Lys | Ala |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Arg | Leu | Ala | Lys | Gly | Leu | Ser | Glu | Asp | Ala | Asp | Leu | Leu | Leu | Leu | Asp |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Glu | Pro | Thr | Asn | His | Leu | Asp | Glu | Lys | Ser | Leu | Gln | Phe | Leu | Ile | Gln |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Gln | Leu | Lys | His | Tyr | Asn | Gly | Thr | Val | Ile | Leu | Val | Ser | His | Asp | Arg |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Tyr | Phe | Leu | Asp | Glu | Ala | Ala | Thr | Lys | Ile | Trp | Ser | Leu | Glu | Asp | Gln |
|     |     |     | 165 |     |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Thr | Leu | Ile | Glu | Phe | Lys | Gly | Asn | Tyr | Ser | Gly | Tyr | Met | Lys | Phe | Arg |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Glu | Lys | Lys | Arg | Leu | Thr | Gln | Gln | Arg | Glu | Tyr | Glu | Lys | Gln | Gln | Lys |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Met | Val | Glu | Arg | Ile | Glu | Ala | Gln | Met | Asn | Gly | Leu | Ala | Ser | Trp | Ser |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Glu | Lys | Ala | His | Ala | Gln | Ser | Thr | Lys | Lys | Glu | Gly | Phe | Lys | Glu | Tyr |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| His | Arg | Val | Lys | Ala | Lys | Arg | Thr | Asp | Ala | Gln | Ile | Lys | Ser | Lys | Gln |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Lys | Arg | Leu | Glu | Lys | Glu | Leu | Glu | Lys | Ala | Lys | Ala | Glu | Pro | Val | Thr |

20060521 013000

```
<210> 5
<211> 22
<212> DNA
<213> Enterococcus faecalis
```

<400> 5  
tctagatatc acgatggata cc 22

<210> 6  
<211> 23  
<212> DNA  
<213> Enterococcus faecalis

<400> 6  
tctagattgc cgtacttatac acc 23

<210> 7  
<211> 31  
<212> DNA  
<213> Bacillus subtilis

<400> 7  
catatgaaag agatcgtaac attaacaaaac g 31

<210> 8  
<211> 31  
<212> DNA  
<213> Bacillus subtilis

<400> 8  
ggatccttag tcttttttgt cttgatgatc c 31

<210> 9  
<211> 19  
<212> DNA  
<213> Bacillus subtilis

<400> 9  
catatgtcga aaattgaac 19

<210> 10  
<211> 21  
<212> DNA  
<213> Bacillus subtilis

<400> 10  
ggatccttat gatttcaaga c 21

20060501 12505001